Motorola 52nd Street Superfund Site
Community Advisory Group (CAG) Meeting

Wednesday, March 9, 2005
6:00 p.m. to 8:00 p.m.
Arizona Department of Environmental Quality - Conference Room 250
1110 West Washington Street
Phoenix, Arizona

MINUTES

CAG Members in Attendance:
Hildellred Chambers Add
Rey Covarrubias
James Felix
Jeanne Lindsay
Ruth Ann Marston
Marvin Martin
Mary Moore
Patricia Zermeño

ADEQ Staff in Attendance:
Kris Paschall, ADEQ Project Manager
David Haag, R.G., ADEQ Project Hydrologist
Monica Mascareno, ADEQ Community Involvement Coordinator
Phil McNeely, ADEQ Tank Programs Division Director
Joe Drosendahl, ADEQ Tank Programs Division

EPA Staff in Attendance:
Nadia Hollan, EPA Remedial Project Manager

EPA Support:
Wayne Schiemann, U.S. Army Corps of Engineers

Additional Agency Personnel in Attendance:
Nancy Mangone, AZ Attorney General's Office

ADEQ Contractor:
Nancy Nesky, LFR Levine Fricke

Others in Attendance:
Jay Quimby
Bob Frank
Joe Drosendahl
Rob Hinchee
Troy Meyer
Mary Gerut
Tom Mooney
Mike Long
Samantha Fearn
Prabhat Bhanganer
Cynthia Parker
Gail Clement
Doug Bartlett
Tom Suriano
Jerry Orlando
C. Gherman
Barbara H. Murphy
Rebecca Godley
Doug Las Juelcor
Rene Chase Dufault

OU #06-029

1. Call to Order and Introductions (Monica Mascareno. ADEQ)

Monica Mascareno, Arizona Department of Environmental Quality (ADEQ) Community Involvement Coordinator, opened the meeting. All ADEQ staff, EPA staff, Community Advisory Group (CAG) members, Company Representatives, and audience members introduced themselves. Ms. Mascareno briefly reviewed the meeting agenda. During the introductions, index cards were provided to meeting attendees so that comments or questions could be written down and forwarded to the front of the room so that they could be addressed during the Call to the Public portion of the agenda.

2. Honeywell 34th Street Corrective Action Plan, Jet Fuel Cleanup to Begin (Honeywell)

Ms. Troy Meyer, Western Portfolio Manager for Honeywell, introduced herself and stated that Dr. Robert Hinchee would be leading the discussion on the Corrective Action Plan (CAP) for the jet fuel cleanup at the Honeywell 34th Street Facility.

Dr. Hinchee opened the discussion by stating that Honeywell had received preliminary approval from ADEQ and that a public comment period on the CAP began last Monday. Dr. Hinchee explained what was in the handouts and provided a general summary of the historical operations at the 34th Street Facility indicating that operations began there in 1951. When jet fuel was discovered in April 1999, they had already suspected a problem because the SVE system was treating more jet fuel than solvents. Honeywell used trichloroethene (TCE) from the start of operations until around the mid-1980s and used trichloroethane (TCA) from the mid-1970s to the mid 1990's.

The design of the remediation system was currently underway and should be completed by the 2nd quarter (April-June) of this year. System startup should occur in 2006; however, there might be delays due to the long process to obtain the required air permits from Maricopa County. Honeywell was working with the regulatory agencies to get these permits as quickly as possible. A CAG member asked where the jet fuel contamination was located on the airport property. Dr. Hinchee stated that he was unsure since the jet fuel from the Honeywell 34th Street facility was not the only source. There were other sources of jet fuel in the area.

Makeup of Jet Fuel Plume

Results of an analysis of the free product collected from monitoring wells located on the Honeywell 34th Street Facility property indicated that 99.9% of the free product contained jet fuel. Jet A, a common jet fuel, was the predominant type of jet fuel found accounting for more than 65% of the free product. Another type of jet fuel, JP4, which is used in smaller and military aircraft, was also found in the free product at less than 35%. JP10 was also determined to be a constituent in the free product. Some chlorinated solvents were detected in the free product samples collected. Most of the chlorinated solvents found in the free product included: TCE, 1,2-dichloroethene (1,2-DCE), 1,1-dichloroethane (1,1-DCA), and vinyl chloride (VC). The free product contained less than 0.1% of chlorinated solvents. Dr. Hinchee made reference to an agency handout that was provided at the meeting which described the relationship between a "part per million (ppm)" and "percent". There are 10,000 ppm in a 1% solution.

A CAG member inquired whether the measurement of the "less than 0.1% of chlorinated solvents" was by weight of the hydrocarbon versus the weight of the solution. The CAG member followed up by inquiring as to whether or not the "less than 0.1%" was referring to weight mass or per volume. Dr. Hinchee indicated that while he was not sure, he could find out and get this clarified for the CAG. Further, Dr. Hinchee stated that there should not be much difference since it would still be less than 0.1%.

Another CAG member stated that the chlorinated volatile organic compounds (CVOCs) have migrated and this was why Honeywell was not detecting CVOCs in the samples collected from the monitoring wells. Or, continued the CAG member, the CVOCs were being detected at lower concentrations due to the migration. Dr. Hinchee stated that no monitoring wells to the west had product in them. Dr. Hinchee went on to describe that 1,1-DCE breaks down only in water. Thus, since it was not present in the monitoring wells, it must have gone into water and not into fuel or free product.

Dr. Hinchee referenced one of the site figures provided as a meeting handout which used colors to describe the jet fuel plumes in the area of the Honeywell facility. A CAG member inquired about the southeast corner of the free product plume. Dr. Hinchee indicated that this area was still being investigated. The orange area was the known extent of the plume, but there were question marks on the southern and eastern portions of the plume. Honeywell was still investigating but they did know something about where the plume was not located. The red wells labeled AFFC were from a different release of Jet A. AFFC 21 and AFFC 22 had never shown any jet fuel contamination; however, they were dry today.

A CAG member stated that it had been known for some time that monitoring well ASE-102A has had free product in it. The CAG member inquired as to why various figures and maps had not been updated. Similarly, there were other known wells that were not pictured on the maps provided, such as monitoring well 106. Dr. Hinchee responded by saying that he was unsure if monitoring well 106 had free product in it, but explained that after a new monitoring well was drilled it could take a few months for free product to appear in a new well. Dr. Hinchee stated that any wells with a number higher than 98 were more recently installed wells, and it could not be said for sure if free product would show up in the wells in these areas. Dr. Hinchee indicated that on the handouts provided, the blue squares were the monitoring wells which were just installed or which were planned to be installed in the near future. One member of the audience, Mike Long, a consultant for Honeywell, indicated that all monitor wells in blue had been installed. A CAG member inquired as to the total number of Honeywell monitor wells that were currently installed but there was not sufficient data, or sufficient time had not passed to know for sure whether or not free product would be present in the well. Mike Long indicated that wells 98 through 103 were drilled in January, and wells 104-108 were just finished. The CAG member responded that a total of 10 wells were associated with the Honeywell release. Mike Long confirmed this statement and went on to say that a couple of months would be needed to complete the well installations and well development.

Depth to Water, Free Product Thickness, and the Smear Zone

Dr. Hinchee referred to the figure, which included the X-X' cross-section, stating that there was a representative number of wells located along the alignment. If there were more wells, the line would be longer. The blue lines represented wells that were just installed, and the cross-hatching was the screen interval where a soil gas or groundwater sample could be collected. On the figure, the water level was shown to be located at 75 ft below the ground surface (bgs), and the free product was located on top of the water table. The thickness of the free product was based on how much free product was located on top of the water table. Dr. Hinchee estimated that contamination would be encountered at approximately 40 ft, which would be the start of what is known as the "smear zone". The thickness of the smear zone was estimated to be 35 ft to 40 ft. Therefore, contamination existed from about 40 ft bgs to the water table with a thin layer of free product on top of the water table. The free product reached a maximum of just over 4 ft in some areas with most wells having less than 1 ft of free product thickness.

A CAG member stated that it was her understanding that the free product thickness in monitoring well 102A was almost 3 feet. One of Honeywell's consultants in the audience replied that it was currently more than 3 ½ ft and nearly 4 ft in well 102A.

Dr. Hinchee described the general physical properties of the contamination at the Honeywell 34th Street facility. Jet fuel was lighter than water and was referred to as an LNAPL or a "light non-aqueous phase liquid". When LNAPLs hit the water table, they spread out horizontally. Conversely, chlorinated solvents

were heavier than water and were referred to as a DNAPL or "dense non-aqueous phase liquid", and these chlorinated solvents kept migrating downward until they hit a less permeable barrier. Dr. Hinchee explained that with less than 0.1% of chlorinated solvents in the free product, the density of the mixture (jet fuel and chlorinated solvents) did not change.

The water table near the property had been falling. The smear zone began at around 40 ft bgs and the water table was now located at approximately 75 ft to 80 ft bgs. A CAG member asked about the timeframe involved in the falling of the water table. Dr. Hinchee replied that Honeywell did not have monitoring wells at the site when the water table was at 40 ft bgs. Honeywell looked at Salt River Project (SRP) well data in the area, but that data did not indicate what was happening at the site. Dr. Hinchee said that they really didn't have any site water table data for the period before 1992 when the first wells were installed below 40 ft bgs.

Mr. Bob Frank, a contractor for Honeywell, indicated that the water table along the eastern side of the property in 1992 was somewhere in the range of 37 ft to 40 ft bgs. A CAG member asked about the potential for CVOCs in the smear zone and in the water table affecting the design of the remediation system, and what would be done with the CVOCs. Dr. Hinchee stated that their treatment system would do some cleanup of the CVOCs. The CAG member followed up by inquiring if the CVOCs were 0.1% of the jet fuel plume, can we assume that there was a concentration in that order in the water table? Had Honeywell done any testing of CVOCs below the water table? Dr. Hinchee indicated that testing had been done, and the concentration was less than 0.1% but much less than this was dissolving into water because the solvents were much more soluble in oil than in water. The CVOC concentrations that had been measured in the water were in the parts per billion (ppb) range (somewhere around 10 ppb). The focused remedial investigation (RI) report prepared by Honeywell for the facility included CVOCs, and they did affect the design. However, the presence of the CVOCs did not affect the *purpose* of the design since the jet fuel was being remediated under a different regulatory program than the CVOCs. Honeywell paid attention to the chlorinated solvents so they were understood, but this was not a design for the purpose of remediating the chlorinated solvents. This design was done under a different regulatory program.

Dr. Hinchee indicated that in 1992, the water table was just below 50 ft bgs on the left side of the X-X' cross-section shown on the handout provided at the meeting (and previously discussed). More complete water table data was available in 2001, and more recent data (through 2004) had also been collected and used in the design preparation.

Discussion of Remedial Alternatives

Dr. Hinchee discussed the various remedial alternatives that Honeywell evaluated for the cleanup of the jet fuel that contained CVOCs. Honeywell reviewed every available technology and settled upon the following three alternatives as described in the CAP:

1. Alternative 1 – Free product skimming; groundwater pump and treat, and monitored natural attenuation (MNA)
2. Alternative 2 – Multi-phase extraction (MPE); soil vapor extraction (SVE); MNA
3. Alternative 3 – Bio-enhanced soil vapor extraction (BSVE); free product skimming; MNA

Dr. Hinchee explained that the MPE technology simultaneously extracted water, jet fuel, and air. However, because of the falling water table, this technology was not very effective. MPE was frequently done on LNAPL plumes and was used at the AFFC Site to clean up jet fuel contamination underneath the airport. Initially, some recovery was achieved, but overall the technology proved to be very ineffective.

A CAG member inquired again whether the water table at 40 ft in 1975, and now at 70 ft in 2004, was causing the water to "run" from the contaminant. Dr. Hinchee stated that it did appear this way, but the drop in the water table over the past 30 years had created the smear zone.

Another CAG member re-addressed Dr. Hinchee's statement that Honeywell had reviewed every available technology, and asked if Honeywell reviewed only broad categories instead of specific remedies. Was the information on what was evaluated available? Dr. Hinchee responded that they did not document anything other than the three alternatives listed above, but they did look at the typical remedies. Ms. Meyer added that Honeywell conducted a screening of various remedial alternatives and that a table of these alternatives was provided in the CAP. The CAG member asked if screening criteria were used to get down to these few technologies that were considered. Ms. Meyer confirmed that the table in the CAP would provide this information.

The same CAG member inquired about Alternative #1 when Honeywell stated that the technology would not remove much of the mass. The CAG member wanted to confirm that Alternative #1 was talking about free product skimming and removing the free product plume. Dr. Hinchee stated that when he was discussing Alternative #1, his comment regarding low recovery only applied to the pump and treat portion of Alternative #1 and not to all technologies in Alternative #1. Dr. Hinchee followed up with the AFFC site where MPE was used initially with some limited success, but due to the falling water table, it became ineffective, and they (AFFC) were now using bioventing.

Honeywell selected Alternative 3, and this alternative had received preliminary approval by ADEQ. The BSVE technology would be the technology that removed most of the contamination. Dr. Hinchee referred to one of the figures (provided as a meeting handout) that described the well locations for the BSVE on the cross section discussed earlier. This figure had been elongated in the vertical direction. If the figure was drawn to scale, it would be difficult to see as it would be a long, narrow ridge. The figure displayed the locations of the air injection wells, vapor extraction wells, and soil vapor monitoring points. Dr. Hinchee indicated that the objective was to get air throughout the smear zone; if the smear zone was made aerobic (with oxygen), then the biodegradation was more effective. Although the petroleum hydrocarbons were not supposed to be floating on the water table, petroleum hydrocarbons were naturally occurring, thus there were many bugs which used the petroleum hydrocarbons as a food source. There was likely more oxygen in the deeper soils, but now there was a slower biodegradation rate due to the methane present in the subsurface. The methane was a byproduct of anaerobic (without oxygen) biodegradation. Dr. Hinchee explained that by adding oxygen to the subsurface in the smear zone, they could increase the rate of biodegradation substantially and stop the production of methane which was a result of anaerobic biodegradation.

Dr. Hinchee indicated that the people working on the AFFC plume tried alternative #2, and it was initially effective, but not any more due to the declining water table. They added air only to the subsurface and did not extract any vapors from the subsurface. In the case of the Honeywell's jet fuel cleanup project, Dr. Hinchee explained that this was not an option for Honeywell. Honeywell must extract vapors safely to be

able to add air without causing further migration of the CVOCs. This was the difference between the Honeywell jet fuel remediation and the AFFC jet fuel remediation. Honeywell would be monitoring the system to make sure that the CVOCs didn't migrate further. Petroleum hydrocarbons were natural, and many organisms were already adapted to degradation of these compounds. Chlorinated solvents, however, were manmade and required certain conditions that were less predictable to be remediated by using biodegradation.

A CAG member asked if microorganisms were added to the subsurface. Dr. Hinchee indicated that typically you did not add microorganisms for this type (jet fuel) of remediation, and Honeywell wouldn't be adding microorganisms to this subsurface. He had never worked on a site that did not already have the necessary microorganisms or bugs required to remediate the petroleum hydrocarbons. A CAG member asked Dr. Hinchee what other sites he had worked on. Dr. Hinchee said that he started his career about 25 years ago with hands-on remediation systems and got involved in research which led him to work on hundreds of sites around the world. He worked on a project involving 140 different U.S. Air Force sites using bioventing and soil vapor extraction for the purpose of developing some of the principles used today and to look at how the systems were formed.

A CAG member asked at what pressure the air would be injected into the subsurface and what size piping would be used. Dr. Hinchee stated that the pressure needed would depend on how much was needed to get into the ground. Since the ground at the site was very permeable, a very low pressure (few pounds per square inch (psi) at the most) would be applied. Piping sizes and wells vary from 2 to 4 inches since they were trying to use some existing wells where possible.

A CAG member asked if Honeywell was going to use wells that were screened into the water table. Dr. Hinchee indicated that, yes, many would be screened both above and below the water table to account for the falling water table. Dr. Hinchee referred to the X-X' cross section figure provided to illustrate that many wells were being constructed in this manner. The CAG member inquired whether or not some of the injected air would be injected into the groundwater. Dr. Hinchee stated that no air would be injected into the water. The contamination would go in the path of least resistance, so it would choose the vadose zone (soil column), which was why they had wells that included a screen interval above the water table. Another community member asked if more hydrostatic pressure would be exerted if the water level rises, thereby pushing the air into the water. Dr. Hinchee replied that Honeywell did not intend to continue to inject air if the screen was completely below the water.

A CAG member stated that Jet Fuel A was basically virgin jet fuel, uncut kerosene, but what about JP4 and JP10 used for military aircraft? The CAG member stated that JP4 and JP10 had a lot of additives for high altitude, high flow, and anti-icing. Dr. Hinchee clarified that JP4 was different from Jet A, but it did not have a lot of additives. JP4 was a lighter fuel (than Jet A) and looked like a blend of gasoline and Jet A. Most of the volatiles produced would come from the JP4 component. JP10 was only present in one well at this time, and there was not very much of it. JP10 was a heavier hydrocarbon and not as volatile. This site had chlorinated solvents, and these biodegraded differently than petroleum hydrocarbons. Figures provided as meeting handouts showed that the chlorinated solvents could be degraded by anaerobic dechlorination and go from PCE to TCE to DCE, and finally to vinyl chloride (vinyl chloride could be more toxic than TCE). Dr. Hinchee continued by saying that when petroleum hydrocarbons were biodegraded, the byproducts were not the same and didn't pose a problem. Most of the volume of jet fuel would be of the JP4

type. There was JP10 in one well, and this might require skimming or biodegradation.

Honeywell's design would start with more extracting than injection, somewhere on the order of two to three times the injection rate to ensure capture of vertical or horizontal migration of contaminants. These systems tended to be more efficient if just injected with air; however, this could not be done safely without the risk of spreading the contamination. Over time the volatile components might be removed more quickly when the heavier compounds biodegraded.

Honeywell would eventually do more injection and less extraction as the heavier compounds decreased in concentration. Petroleum hydrocarbons would be readily removed by vapor extraction. Free product skimmers would have concentrations of CVOCs in them, and the material removed would be disposed of properly. Water table monitoring began at the site in 1992, and the water table had been falling ever since. Historically from past records for SRP wells in the valley, a long-term water table drop could be seen. Dr. Hinchee referred to the hydrograph in the meeting handouts that provided water level data since 1935. The hydrograph depicted one SRP well which was the closest well to the site and might provide more understanding of what happened at the site since 1935.

A community member asked if the release happened prior to 1986. Ms. Meyer indicated that Honeywell had been using petroleum hydrocarbons (jet fuel) since it first began operations in1951, so the release could have occurred anywhere from 1951 until 1984 when they upgraded their underground storage tanks. Ms. Meyer went on to say that it was not until 1999 that Honeywell discovered free product in monitoring wells.

A CAG member asked if other SRP wells were considered in order to get an average look at the historical water table. Dr. Hinchee indicated that yes, other wells were looked at but this was the closest so it was put on the map. The changes in the water elevations in the well could be from over pumping, dry years, or wet years.

Discussion of Declining Water Table

A CAG member asked if the fall in the water table was caused by over-pumping in the area. Dr. Hinchee indicated that throughout the valley there was less recharge, and there was more pumping in the outer valley. Another CAG member asked if one of the wells was shut down in the early 1980s when contaminants were found in the water. Honeywell's consultant stated that in the early 1980s, SRP well 18E 5N located along the canal near 40th St. and Van Buren was shut down. This well was currently pumping groundwater. Another CAG member stated that this pump was only used as a booster pump now so it did not pump a lot of water.

One CAG member indicated that the overall trend was a decline and that while there may have been short periods of a rising water table, there were several years during which the water table dropped back down below the previous level. The CAG member went on to ask that if the early 2005 rains had already caused a 3 ft or more rise in the water table, and why did Honeywell think that this would not have any effect on the contamination? Mr. Mike Long, a contractor for Honeywell, indicated the water table would drop back to the pre-rainy-season condition. It took a total of 18 months for the water table to rise to its highest levels, and it would take 18 months to drop back to the old water level. Mr. Long also stated that basin-wide pumping outweighed recharge from flood events; even flood events that might last several months like the one that the airport area experienced early in 2005.

A CAG member asked how long the current increase in water levels would take to reach a peak, and how did you know the length of time that it would take for the water table to return to pre-flood conditions? The CAG member also asked if there was a rise in the water table of over 3 ft already, why would Honeywell make the assumption that there would be no effect on this project? Mr. Long replied that the rise in water levels would go at least as long as the river flows, but it would reach a stable point. According to Mr. Long, for the 1992-93 floods, it took about the same amount of time to return to pre-flood conditions as it did to reach the flood conditions – about 18 months to return to a stable condition. Mr. Long stated it was not possible to predict the current length of time for the water levels to reach its peak. Further, what was being seen at a localized area was nothing compared to what may be seen on a basin-wide area. Predictions on the return of water levels could also depend on how long the high water conditions existed.

Dr. Hinchee indicated that the declining water table had a lot to do with selecting the alternatives to be considered. Honeywell was confident that the declining water table was a long term trend. A CAG member asked if the water table did not continue to drop as Honeywell predicted, what would happen to the remediation system that was currently being designed and constructed? Dr. Hinchee indicated that the system would still treat the smear zone, but there would be no treatment of the smear zone that was covered by the water table. Honeywell would have to wait until the water table dropped again and exposed the smear zone from which soil vapors could be extracted. A CAG member inquired whether or not the lack of a declining water table would affect any of the wells used. Dr. Hinchee replied that, no, Honeywell was more concerned that the water table would drop too much and fall below the well screen.

A community member asked if a 4-inch monitoring well could be converted to a deeper well if the water table dropped. Dr. Hinchee indicated that if a well went dry, Honeywell would drill another well and the well that went dry would be converted to extract air or vapors. A CAG member commented that the 1993 floods were a more localized flood event than what the valley was currently experiencing with a flow of about 18 ft to 20 ft in the river and a rise of about 2 to 3 ft near the Honeywell facility. Mr. Long indicated that the area had lost approximately 28 ft of saturated thickness near the facility with an average loss of 4 ft/year from 1998 to September 2004.

Design of the Remediation System

Getting back to the design, Dr. Hinchee indicated that the figure provided as a meeting handout showed the free product area in orange and the vent wells (designed to be extraction or injection) in blue. The remediation system would include underground as well as above ground piping on the Honeywell facility. The remediation system would include a series of pipes, one for extraction of air, one for injection of air, and a third for liquids. There would not be a groundwater pump and treat system initially constructed; however, the piping being installed was over-designed (both in capacity and type) to accommodate a groundwater pump and treat system just in case one was needed in the future. This was to accommodate the airport since the pipes must be constructed underneath the runway. The pipes were oversized to carry more air than was currently needed with another pipe to carry liquids should this be needed in the future. Dr. Hinchee clarified that the current design included monitoring well 102A, even though the design was done prior to Honeywell's discovery of free product in 102A.

A CAG member asked Honeywell to confirm that the size of the jet fuel plume was about 40 acres. The CAG member indicated that with the discovery of free product in monitoring well 102A, the size had increased from approximately 34 acres to 40 acres. Dr. Hinchee stated that when free product was found in

102A, Honeywell estimated the free product plume to be 40 acres, and this could increase again with the discovery of new information. The CAG member inquired how the design would account for this increase in size and also for any potential new spill areas or new spill volumes. Dr. Hinchee clarified that while Honeywell provided estimates of the free product area (35-40 acres), the actual design footprint covered 100 acres which was considerably larger than the current known free product plume area.

Another CAG member asked if Honeywell would biovent simultaneously for all areas or would do certain areas first and other areas later. Dr. Hinchee stated that the intention was to do it all at the same time, but since Honeywell was in the process of defining the contamination at the airport, they would start on the Honeywell facility where the plume was characterized. Honeywell would implement the airport portion of the remedy when they had fully characterized the jet fuel.

Dr. Hinchee described the computer simulation of oxygen concentrations in the subsurface for the jet fuel project. The simulation included concentrations of oxygen from 20% to 0%; at least 5% of oxygen was needed for biodegradation to occur. Dr. Hinchee used the computer simulation to help identify where the "dead spots" were in the subsurface, and concluded that the site was sufficiently aerated. Dr. Hinchee cautioned that this model was just a forecast, like the weather, so Honeywell would also be collecting monitoring data to validate the model.

One community member asked if the model showed the oxygen utilized by microbes or just the available oxygen. Dr. Hinchee replied that the model showed the oxygen utilized by the microbes. He went on to explain that all wells were extraction/injection, and Honeywell could vary the injection/extraction scheme to remove dead spots or, in other words, to change the airflow in the subsurface to aerate dead spots.

Another community member asked what day of the remediation this model was supposed to represent, e.g. startup or conclusion? Dr. Hinchee replied that the model was simulating steady state conditions which should occur around 30 days after startup. At this point, Dr. Hinchee explained, they'd be able to see what was really happening. They would use an observational approach to operating the system. Honeywell would not change air flow rates but would install additional wells to inject more or less air.

A CAG member asked if 5% oxygen seemed to be a little low, wouldn't you want a higher oxygen concentration? Dr. Hinchee indicated that organisms could degrade petroleum hydrocarbons in as little as 1% to 2% oxygen, but the rule of thumb was 5% oxygen to ensure that the "dead zones" also got oxygen.

Another CAG member asked if the concentrations of oxygen were before or after the microbes had used what oxygen was needed to biodegrade the petroleum hydrocarbons. Dr. Hinchee indicated that in the contaminated areas there was currently no detectable concentration of oxygen. The CAG member asked how much oxygen was Honeywell trying to get into the subsurface or what the flow rate was. Dr. Hinchee referred to the numbers on the figure and said that the positive numbers were extraction rates (around 70) measured in cubic feet per minute (cfm) for each well, and the negative numbers were injection rates for each well. The total airflow would be designed to be injected at a rate of 2,000 cfm and extracted at a rate of 1,000 cfm. Other computer simulations that were presented showed 2,200 cfm extracted and about 790 cfm injected. Over a 100 acre area, this was not a large volume of air. To put the numbers in perspective, Dr. Hinchee stated that the average swamp cooler injected more air than this into one house, and this was for a 100 acre site. Thus, you would not even feel the air move over the wells.

Dr. Hinchee then touched briefly on the other technologies. A schematic (not to scale) provided in the meeting handouts showed fuel that drained into wells was removed with a pump and pumped to an above ground fuel holding tank. This technology did not remove product very effectively and typically only removed a few gallons per month. Over the past 5-6 years, Honeywell had extracted somewhere around 7,000 gallons total. It was a very slow drainage process, but Honeywell was going to continue to do this, and it was important to do this until the contamination was removed.

Dr. Hinchee explained that MNA would be the technology used to remediate the hydrocarbons in groundwater that migrated rapidly once dissolved. The monitoring process described by Dr. Hinchee included the following:

1. Prove that MNA was working
2. Document a stable plume – would need one downgradient sentinel well
3. Ensure that while MNA was employed no one was exposed

Natural attenuation specifically went after the dissolved hydrocarbon contamination in groundwater. Dr. Hinchee explained that hydrocarbons readily degraded once dissolved in water. Natural attenuation was a process where rate of dissolution was slow compared to the biodegradation rate. Under natural attenuation, the dissolved plume didn't really get bigger than the free product plume. MNA included monitoring this process to demonstrate that the system was stable and to prove that MNA was working. MNA also included the monitoring of sentinel wells (wells that were clean, and if they became contaminated then the plume was migrating). During MNA, it was important to ensure that no one was drinking the water. Dr. Hinchee stated that one of the meeting handouts was the EPA's Citizen's Guide to Monitored Natural Attenuation, a very commonly applied approach. EPA estimated that 80% of the remediation of hydrocarbons across the county used some form of MNA.

A CAG member asked about Dr. Hinchee's statement that the dissolved plume didn't get much bigger than the free product plume. The CAG member stated that the free product plume had been as much as 80,000 gallons, and now it was down to 45,000 or 46,000 gallons in the revised CAP. Dr Hinchee cautioned that these estimates were very crude and difficult to make. The CAG member asked if the public could then assume that what was in groundwater was closer to the 80,000 gallons rather than the 45,000 or 46,000 gallons. Dr. Hinchee stated that the "gallons" number was 100% free product, and 100% was a million parts per million (ppm) or a billion parts per billion (ppb) and what was dissolved was present in the ppb range; volume and concentration were measured differently. The CAP provided a map which illustrated the dissolved plume, and showed that the dissolved plume went a little bit more downgradient than the free product plume. But it was not like chlorinated solvents since they didn't biodegrade like petroleum hydrocarbons degraded. Chlorinated solvents could go for miles without much or any biodegradation. The CAG member asked how long it took for the petroleum hydrocarbons to degrade. Dr. Hinchee responded that they dissolved pretty quickly, but the treatment of the residual material through the bioventing, soil vapor extraction and free product recovery was slow. The CAG member redirected to ask how long it took for the hydrocarbons to biodegrade in the groundwater. Dr. Hinchee stated that he wasn't sure. Once hydrocarbons were dissolved, it was more important to determine how long it would take a groundwater remedy to clean it up. Honeywell had projected that the BSVE and free product recovery would operate for 7-10 years, and more would be known as the system began operating. Dr. Hinchee continued by saying that

typical remediation timeframes for these technologies were 5-10 years, and if the water table continued to fall, then it could be faster. If the water levels stayed high, it could be longer since the smear zone would not be exposed.

Another CAG member asked how many additional free product skimmers would be added. Dr. Hinchee responded by saying it was in the CAP, and it depended on the free product thickness in the well and recoverability. The CAG member asked how many skimmers were now on-site. Mr. Frank stated that there were about six on site. The CAG redirected to say that there were six skimmers running right now. Mr. Frank said no, there were no automated skimmers on site at this time. There was one skimmer at well ASE-20 which generated just over 4,000 gallons of the previously mentioned 7,000 gallons total that had been removed to date. Mr. Frank indicated that free product was currently removed manually with a pump. Dr. Hinchee restated that only about1 to 2 gallons per month were able to be recovered at this time. Mr. Frank explained that if the water table rose then the hydrocarbons could float, and the productwould be trapped beneath the surface.

Mr. David Haag, ADEQ Project Hydrologist for Superfund, inquired about MTBE concentrations being remediated by MNA. Dr. Hinchee stated that Honeywell was still trying to find the source of the MTBE but was not aware of any releases of gasoline at the facility. He continued by stating that MTBE was an additive to gasoline and would biodegrade.

A CAG member asked where the MTBE was found on the site. Mr. Frank stated that the MTBE was primarily found on the eastern side of the free product plume. Dr. Hinchee stated that the levels that were being found were much lower than one would usually find with a gasoline release, so Honeywell was unsure of the source or source area. The same CAG member asked about the number of wells that were manually pumped each month. Mr. Long stated that up to 30 have had sufficient free product to be pumped, but only about 15 wells currently had sufficient product to be pumped. According to Mr. Long, the 1 to 2 gallons per month were the combined total of all wells that were pumped.

A CAG member asked if Honeywell had a fueling station on the property to fuel the company vehicles. Mr. Frank stated that Honeywell used a gas station on the corner of 36th St and Washington to fill their vehicles. When the last tanks were pulled from this service station, there was evidence of a leak of both diesel and gasoline. The CAG member inquired again if Honeywell fueled all of their vehicles from an off-site gasoline vendor. Mr. Frank indicated that yes, all vehicles were fueled off site. Ms. Hollan asked if Mr. Frank knew of any investigation at the service station. Mr. Frank said that there was a small release of diesel at the pump station, and the soil was excavated. However, there was not a release to groundwater, and contaminated soils were excavated to 10 feet. Ms. Hollan asked if Honeywell was looking into the release. Another CAG member stated that there was a Texaco located near 29th St. and Washington. Ms. Meyer stated that there was some information which stated that occasionally MTBE residual could be present in JP4. Dr. Hinchee stated that MTBE was not normally added to JP4, but it had happened in the past. Honeywell was attempting to try and figure out where the MTBE was coming from. A community member stated that there was a former Chambers Electric located at 36th St. and the railroad on the eastern side of 36th Street that had a small 2,000 gallon gasoline tank which had a release.

One community member asked how Honeywell planned to go from the conceptual design prepared in the CAP to a design that could be used to construct a system in the field. Ms. Meyer stated that they were going to be providing a full design package to ADEQ for their review and comment. These documents would also

be provided to the City of Phoenix Aviation Department for review and comment. Ms. Meyer stated that after a design was generated, Honeywell would begin work on an Operations and Maintenance (O&M) Plan for the treatment system. Additionally, Ms. Meyer stated that the revised CAP would also include a large document on contingency actions which would be discussed in a meeting where Honeywell, ADEQ, and the City of Phoenix Aviation Department would come to a consensus.

Ms. Meyer discussed Honeywell's desire to design a "healthy system", which would be monitored on a regular basis for a variety of parameters. Ms. Meyer stated that the documents would be discussed openly and input received from the Superfund group, and the UST group might also provide comments. Traditionally, most of the comments submitted came from the Superfund Group..

Ms. Meyer also discussed a new leak at the Area 2 fuel farm that was reported to ADEQ. Honeywell detected a potential loss of jet fuel in its inventory and investigated whether there could be a leak. After conducting a pressure test to the associated piping, it was discovered that both the inner and outer pipeline was leaking. The system was emptied, and the area was excavated. Ms. Meyer also spoke of another fuel spill at the Flight Line on December 30, 2004. Honeywell reported a release of jet fuel from a tanker truck in Area 1 to ADEQ. The soil contamination was characterized, excavated, and disposed of off site.

One community member asked Ms. Meyer if Honeywell was confident that they had identified all of the source areas and eliminated any additional or ongoing fuel discharges on the property. Ms. Meyer said that they were, but she just received a report that there was a suspected release last week. Ms. Meyer added that Honeywell had 22 tanks with associated piping. So far 12 tanks and piping had been pressure tested, and one of these pipes indicated a release. Honeywell would be testing the other 10 tanks/piping for pressure drops or anything that might indicate a release, and they would report and address any suspected release immediately. Ms. Meyer stated that they had investigated a couple of potential sources east of the Honeywell facility and had not found anything which indicated any additional source of petroleum. Dr. Hinchee said that realistically, this was a facility that stored and handled a lot of fuel with risks of releases, but the risks of releases today were much lower than historically when people didn't routinely test underground tanks.

A CAG member expressed the desire to see the final design package prior to the construction of treatment system components, what empirical data that the design was based on, and exactly where, how and what would be sampled. Since this information is not required until the O&M documents are prepared (perhaps over a year away), the community members and CAG members wanted to see this information sooner than later. And if the project was still under UST jurisdiction, then the CAG believed it was up to Honeywell to implement what they said they were going to implement. Ms. Meyer stated that Honeywell was trying to accommodate both programs (the UST program and the Superfund program) and not use one to get out of the other.

Ms. Meyer indicated that Honeywell would add new documents (concerning the design package) to the two libraries (site repositories) at the same frequency that they were entering historic documents. Honeywell would also be willing to have periodic presentations to the CAG group on site status, how the design was going, and where Honeywell was with the draft O&M manual. A CAG member stated that it would be interesting to learn the specific procedures that would let Honeywell know if the system was operating well, how Honeywell would know that the oxygen was reaching everywhere that it was supposed to reach, how Honeywell would know that the vacuum had not been lost, and that there wasn't horizontal spreading to

other areas. Dr. Hinchee indicated that they were designing a "healthy system", which was a table which defined what would be monitored, why it was being monitored, where it would be measured, and what the frequency of monitoring would be. This was part of the current design process and would be completed in the O&M plan. The CAG member indicated that since the public did not know what Honeywell would put in the O&M plan, they were not able to submit public comments on this during the current public comment period. The CAG member indicated that it would be beneficial to have Honeywell present the empirical basis that they were using for this. Ms. Meyer stated that the model, the conceptual design, and other related documents were provided, and the parameters that would be monitored were discussed as well. Ms. Meyer stated that as additional information was collected on the airport, it was possible that additional wells might be required or might need to be relocated depending on taxiways and runways. Ms. Meyer indicated that the piping was over-designed to accommodate more wells that may be added in the future if necessary; and these wells would be monitored for the same parameters and at the same frequency as the initial wells. Honeywell believed that most of the jet fuel contamination was in the soil. Further, Ms. Meyer indicated that this wouldn't be the "be all, end all", but at least it was something to get started on removing contamination from the ground.

A CAG member commented that the current problem was that the public did not know what site-specific data was used to back up the numbers that were used for the computer modeling for the design. Dr. Hinchee indicated that most of the data was located in the archives, and additional data was received from the City of Phoenix West Sky Harbor and AFFC Sites. Based on the sites being adjacent to the Honeywell facility, the Honeywell release was expected to have similar behavior as these two sites, and these similar behaviors had been incorporated into the design. Dr. Hinchee indicated that at some point you needed to use the data that you had to make a design, and then go in to the field and start remediating. Honeywell understood that the system being designed would start remediating this site and be reasonably effective. Dr. Hinchee also indicated that Honeywell understood that the system would need to be optimized as it was installed and applied.

Ms. Meyer explained that a major source of site-specific data was from the pilot study that was done. It provided a lot of information about the actual dynamics about the subsurface which was a part of the submittal. A CAG member indicated that while it was submitted, it would be very beneficial for Honeywell to present this data to those in the general public that wished to provide comments on the design package. The CAG member mentioned that while it was appreciated that Honeywell was saying that the system was oversized, the CAG would like to know by what percentage the system was oversized. Dr. Hinchee referred to the modeling on a 100 acre footprint and stated that Honeywell only knew of about 35-40 acres of contamination. They knew that some of this was not contaminated but also knew that there was enough air movement to treat the entire 100 acres. On top of this, Honeywell had included in the design a 50% design factor (50% larger than is needed and can carry 50% more air than is needed). Other flexibilities were built into the system such as: increasing the air flow, increasing the pressure, and the addition of pipes if necessary. According to Honeywell, conservative engineering assumptions were made. Dr. Hinchee indicated that another important aspect of the remediation was the air treatment. His expertise was in remediation below ground, but Honeywell had contracted with Dr. Jay Quimby who was an expert in air treatment.

At this point, Ms. Mascareno stated that Marvin Martin, CAG member, had a quick announcement. Mr. Martin announced that this CAG meeting would be his last meeting as a CAG member for the Motorola 52nd

Street Superfund Site. He indicated that there were good people here to continue the work of this CAG. One of the reasons that Mr. Martin was resigning from the CAG was that he began a new position with ADEQ on Monday. Mr. Martin assured the meeting attendees that he knew the good work of the CAG would continue. He had enjoyed working with everyone and looked forward to working with everyone again sometime in the near future. Ms. Mascareno then recessed the meeting for a five minute break.

Air Treatment in Remediation System Design

Dr. Jay Quimby started his portion of the presentation with a brief summary of his background and stated that he was considered an expert in the field of air pollution control and air pollution design. He had 25 years of experience, including doing work with the U.S. EPA, New Jersey Department of Environmental Protection, and air pollution control manufacturers. He had also taught at universities. Dr. Quimby's current consulting role was to oversee large air pollution control projects nationwide for CH2M Hill; specifically to ensure that they were designed, constructed, and operated properly.

Dr. Quimby indicated that Honeywell looked at a variety of technologies over the past few years for treating the air emissions expected to be generated by the BSVE system. In general, the air could be captured, burned, used as a fuel, or treated with microorganisms. Carbon adsorption and resin adsorption captured the pollutants but didn't destroy the pollutants. These techniques took the pollutants from the gas media and transferred them into the solid media. At this point, the pollutants could be extracted and treated on-site or be sent off-site for treatment. Thermal mechanisms were represented by thermal oxidation and catalytic oxidation and in certain cases volatile organic compounds (VOCs) and petroleum hydrocarbon emissions could be used as fuel to drive a microturbine to create electricity. Honeywell's solution combined multiple technologies which were important because there were multi-element issues for the BSVE treatment system. Multiple technologies provide multiple safeguards, and he would describe the function and role of each piece of equipment.

Dr. Quimby re-stated Dr. Hinchee's discussion of what was going on underground: injection of air to help the microorganism population and extraction of air by use of a blower (or fan) into a piping system. This piping system would be under vacuum, or, in other words, it would be under negative pressure. Thus, if there was a leak in any of the system components, air would come into the system and not leak out of the system. The first thing removed were particulates that might be pulled up with the soil vapor; thus, after this step, the only thing that was being conveyed in the piping was gases or vapors. The next step was a thermal oxidizer or burner to destroy the petroleum hydrocarbons and CVOCs. All of the compounds were converted to carbon dioxide (CO_2) and water, except for the chlorinated organic compounds which produced a by-product called hydrochloric acid (HCl). Thus, byproducts of combustion (HCl) and principal combustion products (CO_2 and water) were created and were in an operating system at 1500° F. Dr. Quimby indicated that this system was a proven, well established technology for treating vapors of petroleum hydrocarbons and CVOCs, which was different from a capture system where pollutants were concentrated and transferred from one media to another media.

Dr. Quimby then discussed the next system component that would treat the gas stream which was the rapid quenching mechanism. The mechanism had many nozzles which continuously sprayed water at 100 gallons per minute (gpm) to treat a few thousand cubic feet per minute (cfm) of air. The purpose of this was to reduce the air temperature from 1500 °F to about 186° F to reduce the likelihood of forming dioxin. Dr. Quimby explained that to form dioxin in a gas stream, there must be chlorine, hydrocarbons, and particulate

matter. Since the contaminants were chlorinated organic compounds and petroleum hydrocarbons, these first two elements were present. However, the particulate matter was removed in the first step of the system. Another thing that could aid with the formation of dioxin was pre-cursors, or things that almost look like dioxin (chemical structure), such as chlorobenzene and chlorophenol. Neither of these two precursor compounds were present at this site. The last ingredient for the formation of dioxin was finely divided metal particles which acted as a catalyst. Dr. Quimby stated that all of this occurred within the temperature range of 400° F to 800° F. Since the gas stream had to pass through the dioxin formation temperature zone, the rapid quenching mechanism was employed to reduce the time period. While dioxins could still form because the gas stream had to briefly pass through this temperature zone, the formation of dioxin was not likely. Sodium hydroxide (NaOH), a caustic, was also added with the water during the rapid quenching mechanism that reacted with hydrochloric acid (HCl) to create sodium chloride (NaCl) which was table salt. If there were sodium dioxide (SO_2) present, the SO_2 reacted with the NaOH to produce sodium sulfate, a naturally occurring mineral in most places in the United States. A small amount of NaOH was added to the water stream to react with the halogen gases or acid gases, and then removed as soluble salts.

As illustrated in the presentation handouts, the incinerator gases were piped up and passed through an "elbow" in the piping, traveled back down, and were cooled. To stop the formation of dioxin, water passed over the plastic media in a packed tower scrubber which allowed the water to come in contact with the gases. Dr. Quimby stated that if the water droplets were too big, the gas would go around the droplet. In Honeywell's BSVE system, approximately 90% of the process water would be recycled. Approximately 10% would be discharged to the sewer or the POTW (Publicly Owned Treatment Works). It could be as little as 1% depending on how the system was operated. A CAG member asked if the process water would go back to the well. Dr. Quimby indicated no, the water would go straight to the City's treatment system via the sewer system. In response to a question from another CAG member, Dr. Quimby explained that the process water was recycled by a pump with a filter so that any particulate matter that might be formed after the combustion process would be removed. Thus, the process water went through a heat exchanger to increase the water temperature to 1500 °F – a system that pulled heat from warm water and transferred the heat to the process water.

One CAG member asked if there was a problem with adding 10 to 20 gpm to the system based on a recent *Arizona Republic* newspaper article which discussed potential infrastructure weaknesses or needs. Dr. Hinchee stated that this was actually a very small volume since larger municipalities typically handle approximately 500,000 gallons per day. Another question was raised about special permitting that might be required. Dr. Hinchee stated that all environmental requirements would be met, and Ms. Meyer added that she would confirm the issue of permits and get back with the CAG member. Based on the well sampling data and the soil gas extraction flow rates, the amount of chlorinated compounds going through the system was anticipated to be only 0.05 pounds per minute.

A CAG member inquired about the shape of the plastic media in the packed tower. Dr. Quimby indicated that the cartoon-picture would actually not have such a conical shape; rather, it would look like ping-pong balls sitting on top of a metal plate. The CAG member stated that the City of Phoenix pre-treatment has reported many issues with cooling towers with high total dissolved solids (TDS) because the salinity levels were ramping up exponentially due to the recent flooding. The CAG member asked if the City had been contacted or if Honeywell had foreseen any potential problems regarding potential high TDS discharge that might require Honeywell to secure a different permit. The CAG member stated that the City had reported

that they were considering enforcing a cap on the amount of TDS in their waste stream. Dr. Quimby stated that the discharge from the scrubber would be approximately 0.10 to 10 gpm in order to obtain concentrations that were okay to discharge.

Dr. Quimby explained that adding a lot of water to a very hot air stream would cause a lot of steam. Air at a certain temperature could handle only a specific amount of water vapor until it became saturated with water vapor. The system would operate at saturation (a process known as vapor conditioning), which prepared the gases for the final treatment step (carbon adsorption and potassium permanganate). Similar to a radiator in a vehicle, many small pipes contained cool water which the gas stream passed over, and the temperature was reduced. The air/fluid entering this step was at 186°F and was reduced to approximately 90° F. The air was still moist with water vapor at the lower temperature. The air never touched the water in the pipes, so it was a closed loop process. In the chiller or condenser, the temperature was dropped below the dew point of those materials that you wanted to capture which was compound-dependent. As an example: for gasoline vapor, the temperature would need to drop to below minus 5 °F to ensure sufficient cooling. Not everything was 100% efficient, and these types of systems were expected to be only 70% efficient. The concentrated vapors were condensed into droplets, then these droplets were put into another packed tower where the droplets grew into large droplets (called nucleation). However, there were a couple of things working against them at the Honeywell site. There was a larger air volume so the chiller requirement would be enormous. Also, there was not a large concentration range that would make this a viable mechanism.

Dr. Quimby went on to describe that the water vapor could now be heated in order to be able to handle more humidity. This value was called the relative humidity. A relative humidity of 50% meant that the air could handle 50% more humidity than was currently present in the air stream. Charts and graphs made for evaluating the effectiveness were typically based on an air stream with a relative humidity of 50%. Therefore, more water vapor to the heated air should not be added since you were trying to match the set parameter on the carbon adsorption efficiency graphs. The vessels proposed for this design would be impregnated by potassium permanganate (KMNO4), which was an oxidizing chemical. This process had been demonstrated to work very well on vinyl chloride which was a contaminant in the groundwater at the Site. After the air stream went through the vessels impregnated with potassium permanganate, it was vented to the ambient air. Dr. Quimby stated that this treatment facility would be located on the Facility at the furthest point away from the public. A CAG member inquired as to the size of the system. Dr. Quimby stated that the system would contain a single thermal oxidizer that would be skid mounted. The CAG member stated that it was not the physical size that she was looking for, but rather the capacity. Dr. Quimby referred to Dr. Hinchee's earlier presentation where up to 2,000 cfm could be extracted, and the thermal oxidizer had a capacity of up to 3,300 cfm. In addition to the temperature factor, Dr. Quimby stated that in order to operate the thermal oxidizer and minimize dioxin formation, there must be good mixing and sufficient residence time.

Another CAG member asked what the source of fuel was for the thermal oxidizer. Dr. Quimby stated that this thermal oxidizer would use natural gas and that the entire system was completely automated. One CAG member asked if this process could produce condensate. Dr. Quimby stated that yes, condensate would be formed and collected. The same CAG member asked how long the filter in the condensate vessel would last. Dr. Quimby stated that for very high use, the filters would be changed out every month. However, a more typical scenario would be that the filters would be changed out every three months. Ms. Nadia Hollan, U.S. EPA, inquired about the management plan for the residuals and waste, e.g. old filters. Dr. Quimby

stated that a plan would be developed, and this plan would also include the monitoring of the air in the area surrounding the filter to ensure that the air was safe for workers. Also being prepared was a Sampling and Analysis Plan for various monitoring parameters and frequencies which would be provided to ADEQ and Maricopa County for review. Dr. Quimby further explained that if the system shut down, then someone would have to manually re-start the system after the problem was fixed. A CAG member inquired about the residence time (the amount of time that the pollutants would be burned) of 1 to 1.5 seconds mentioned when it was stated at a previous non-CAG meeting with Honeywell that the residence time would be 0.5 seconds. Dr. Quimby stated that theoretically only 0.5 seconds was required; however, Honeywell was electing to have a longer residence time to be more effective.

One CAG member asked what the process was for changing out the carbon. Dr. Quimby stated that there was a redundancy in the design since there were two beds of activated carbon. In theory, the second vessel could be used indefinitely. However, since the goal was to expire the beds as soon as possible, the second vessel (lag vessel) was moved to the first vessel position (lead vessel position), and the plumbing was changed to make the former lag vessel the new lead vessel. Then, a brand new vessel was put in to the new lag vessel position.

A CAG member asked Dr. Quimby to confirm that he was stating that there would be no dioxin formation at the Site, but if there was, it would all be trapped with the carbon and never be released. If this was the case, how did they know that all the dioxin was being trapped, and had this been empirically tested on a similar system and measured to show that no dioxin had been released to the atmosphere? Dr. Quimby said that he could not say that there would not be any dioxin formation within the system. However, should dioxin be formed it would be trapped in the carbon and never released to the atmosphere. As far as the basis for this statement, Dr. Quimby referred to many years of research and use of carbon to trap or capture organic molecules. One of the traditional methods of bringing in a new carbon vessel would be to take the spent (used) carbon vessel, heat it up to desorb or release the organic molecules (clean the carbon), and then re-use the carbon. Dr. Quimby stated that this would not be the case for the Honeywell system. Instead, Honeywell would be using only virgin (non-recycled) carbon. For the recycled carbon process to work correctly, the size of the molecules had to have a molecular weight between 40 and approximately 130. Dr. Quimby stated that the size of the dioxin molecule was at least 200; a molecule that large would adsorb to the carbon and never release it. The CAG member asked again whether or not the carbon would adsorb all of the dioxin that may be formed and had it been shown empirically, not theoretically, that it had been monitored and measured to show that there had been no dioxin released from a system? Dr. Quimby stated that he could look into this. For example: activated carbon was used as the last treatment system for chemical weapons disposal programs before the treated air was discharged to the atmosphere. Dr. Quimby indicated that this program would have a large volume of data to show that this was the case. However, Dr. Quimby cautioned that no one continuously monitors it since you have to conduct a stack test, and EPA had a protocol for conducting a stack test to measure for dioxin. A probe was put into the stack to extract a sample and was then passed through a series of resin cartridges to adsorb any vapor dioxin that might be present. The probe was washed and the filter and resin were analyzed in a laboratory to measure the dioxin. Dr. Quimby stated that there was no device that could continuously monitor for dioxin. It would have to be a stack sample. Further, the sample must be collected over a 60 minute period and there must be three sampling events to consider the results valid. The CAG member confirmed that Dr. Quimby would provide some information and/or literature to validate this since during Dr. Quimby's presentation several statements

were made that the math stated one thing but the actual practice produced different results. Thus, the literature would provide the CAG with more confidence on how this all worked. Dr. Quimby stated that Honeywell would test for dioxin. The CAG member asked if Honeywell would conduct the same stack test. Dr. Quimby confirmed that Honeywell would follow EPA procedures for stack testing for dioxin monitoring. Ms. Hollan asked whether the design would include the appropriate components to be able to conduct the EPA stack test for dioxin. Dr. Quimby stated that the design would include all components necessary for the EPA stack test, e.g. sampling points at 8 diameters downstream and 2 diameters upstream, 4" ports at 90 degrees, etc.

One CAG member inquired about the status of the air permit for the treatment system and at what point there would be something written regarding Honeywell's submittal to ADEQ and Maricopa County. Ms. Meyer stated that Honeywell was in the process of developing the application; however, much of the information was sensitive to the final design parameters, and they were not at this stage yet. Ms. Meyer stated that permitting was a time-sensitive issue and a critical path activity. Honeywell could not move forward and operate the system until the regulating authorities had issued the permit. Ms. Meyer stated that the Title V application was submitted for the Honeywell facility; however, this treatment system was not included in this application. Honeywell understood that there was a backlog of nearly one year in Maricopa County to review Title V Permits. Honeywell would need to submit a major modification to this permit to include this treatment facility. Honeywell was also talking with ADEQ about possibly utilizing the CERCLA process to meet the substantive requirements of the permit, without actually having the permit, in order to start construction. Ms. Meyer stated that under the air regulations, no construction activity that would be eventually tied into the air treatment system was allowed unless you already had the permit. Honeywell did not want to delay getting the hardware in the ground if they could avoid this delay. The CAG member stated that this was the Title V permit submitted with the original Corrective Action Plan (CAP) back in 2003 which was submitted to Maricopa County and also went through EPA review process. The CAG member said that it was their understanding that the permit just completed a public review process and would be re-submitted to EPA for a 45-day review. Ms. Meyer was not sure of the current facility Title V permit status, but she would follow-up on this and get back with the CAG member. The CAG member indicated that Maricopa County just hired a new director for the air quality department who started on Monday (March 7th), and additional resources had been committed for the review of Title V Permits.

Ms. Meyer indicated that the next steps to be taken by Honeywell included the submittal of the final treatment system design and the finalization of the characterization to the south. Honeywell had received a lot of comments from the UST group as well as the Superfund group, and Honeywell had participated in a lot of meetings with Joe Drosendahl's UST group. Ms. Meyer continued by stating that the 30-day public comment period was scheduled to end April 6th, and information on this was on the flyer provided as part of the meeting handouts. Honeywell would work with the agency to address the comments to the degree required, and at that point either Honeywell would have final approval or possibly some amendments might be required. If the amendments were significant, then another public comment period might be held before final approval was granted. Ms. Meyer closed by saying that Honeywell really wanted to hear the public's comments and welcomed questions. Comments could be submitted directly to ADEQ or to Honeywell. Ms. Meyer said that she had noted that the CAG would like a presentation on the pilot study, and Honeywell looked forward to providing this presentation. One CAG member stated that it would be beneficial to have Honeywell present the remainder of the Draft Focused Remedial Investigation Report presentation. Ms.

Meyer stated that Honeywell understood that ADEQ would like to have Honeywell complete this presentation after the agency's comments were publicly available; ADEQ would then be in a position to respond to any questions directed to them.

3. Call to Public

Ms. Mascareno stated that at this time meeting participants had the opportunity to ask any additional questions or make any comments regarding the Site. One CAG member inquired of Joe Drosendahl, Tank Programs Division (formerly UST Section), whether or not the UST group believed that the recommended alternative (Alternative 3) was going to effectively remove the free product plume. Mr. Drosendahl stated that the UST program worked a little differently than the Superfund program. As part of the meeting's handouts, Mr. Drosendahl provided a handout which described the UST Corrective Action Plan process in rule. Mr. Drosendahl clarified that the CAP was the Honeywell CAP and not the UST CAP, and Honeywell had the sole responsibility of ensuring the CAP protected human health and the environment. Mr. Drosendahl continued by saying that there were certain milestones that must be met; however, there was no guarantee that this or any other method would work as predicted. A CAP was a living document and changed as needed to protect human health and the environment. If the method chosen by Honeywell was not working, ADEQ, through the rules, could ask for a revision to the CAP or terminate the CAP and have Honeywell develop a new CAP. Thus, ADEQ's or the public's involvement did not end at final approval of the CAP.

Mr. Drosendahl asked if this answered the question, and the CAG member replied that it did not, but she would follow-up with another question. The CAG member asked if it would be correct to assume that Mr. Drosendahl and/or the UST group did not have an opinion on the likelihood of this method to effectively remove the free product plume. Mr. Drosendahl stated this appeared to be a technically feasible method, and biodegradation was working on many sites where there was petroleum contamination. Mr. Drosendahl stated that petroleum was just liquid carbon, and there were bacteria which could definitely work on this. Mr. Drosendahl continued by saying that with multiphase extraction the vapors were all removed from the system, and Honeywell would have to go through a similar air quality process before they were emitted. While the two methods were different, Mr. Drosendahl stated that they were not at opposite ends of the spectrum. Mr. Drosendahl stated that he could not guarantee that Alternative 3 would definitely work. Similarly, Mr. Drosendahl stated that he could not guarantee that one of the other Alternatives was better. Mr. Drosendahl stated that all of the work was being paid for by Honeywell, and they were responsible for making sure that the technology worked. With the free product present and the groundwater levels low, Mr. Drosendahl said that it would be best to start removing the free product as soon as possible before it had the opportunity to dissolve into groundwater.

A CAG member stated that UST should expect many community members to request a public meeting to get a presentation on the CAP and to direct questions to ADEQ staff regarding the Alternative selected. Mr. Drosendahl stated that the rules did allow a public meeting for this purpose. The CAG member agreed but stated that it was unclear as to what triggered a public meeting being held on a CAP. The CAG member continued by saying that many of the public's concern centered on the potential air emissions, and when anyone contacted UST to find out about the air emission standards, they were referred to Maricopa County. Mr. Drosendahl confirmed that Maricopa County had the jurisdiction over air quality standards for the county. The CAG member stated that the community did not like the County's standards.

Mr. Phil McNeely, Tank Programs Division Director, addressed the CAG by stating that Maricopa County did have delegated authority to regulate air emissions. However, his UST group had met with Honeywell, and had never seen a system in the UST program which had a thermal oxidizer, scrubber, activated carbon, and potassium permanganate. Potential air emissions were the UST group's main issue early on, and Honeywell was cautioned that the ADEQ did not want pollutants in the air emissions which might potentially cause harm nor did they want a method which would spread on-facility contamination to areas off-facility and cause things to be worse. ADEQ met with Honeywell and went through a lot of their modeling and work and believed that they had addressed the agency's concerns. As far as the air permit, Mr. McNeely stated that ADEQ did not issue air permits for facilities within Maricopa County – only the County could do this. Further, the UST group would not have approved the Alternative if they did not think that it would work, but they couldn't guarantee that it would work. Mr. McNeely and the UST group could not guarantee that Honeywell would get all of the contamination out, but he stated that Honeywell would remove a good portion of it. ADEQ believed that it was very valuable to get the free product out of the ground as soon as possible. Mr. McNeely continued by saying that the Honeywell 34th Street remedial investigation (RI) was still going on, and the CAP could be revised if necessary. There were several mechanisms in place.

One community member asked if VOCs were found in the contamination, would the UST group work with the Superfund Program or would the site go back to Superfund? Mr. Drosendahl stated that the Superfund program was already involved and would continue to be involved as appropriate. The community member asked if there would be any territorial walls between the UST program and the Superfund program on this site. Mr. Drosendahl said no, there would not.

4. Future Meeting Plans and Agenda Discussion

Ms. Paschall stated that Honeywell would have the opportunity to complete their presentation on the Draft Focused Remedial Investigation Report. Ms. Paschall confirmed that as soon as ADEQ's comments had been issued, a notice to announce this meeting would be sent to the Site's mailing list. It was hoped that this might occur sometime in May.

Ms. Hollan stated that the work plan for the remedial investigation and feasibility study (RI/FS) for Operable Unit 3 should be a valid meeting topic for an April 2005 meeting even though it might not be final. Further, an update on the potential responsible party (PRP) status could be provided. One CAG member suggested the date be set for April 27, 2005. The remaining CAG members did not have any conflicts but did note that one of the CAG members had difficulty attending meetings at this location. Several of the CAG members stated that they preferred to have the meetings at ADEQ instead of at the Burton Barr Library. Ms. Mascareno asked the remaining CAG members present if this was acceptable, and all agreed to keep the meetings at ADEQ with the next meeting scheduled for April 27th.

Ms. Paschall stated that it would be some time before ADEQ was able to give a presentation on the status of the PRP search for facilities located in OU2. Joray Corporation, a former operator of a facility located in OU2 (Kachina Facility), responded to the Special Notice by declining to conduct the RI/FS. Therefore, ADEQ issued a unilateral order (UO) last week which would be effective 30 days from Joray's receipt of the UO. However, Joray did have the opportunity to confer with ADEQ within this 30-day period to avoid the UO becoming effective.

A CAG member asked what specifically was done by Joray. Ms. Paschall stated that during a property transaction, a Phase I and Phase II revealed contamination at the facility above the groundwater protection levels which might be indicative of a continuing source at the facility.

Hearing no more discussion, comments, or questions, Ms. Mascareno adjourned the meeting.

The next CAG meeting would be held on April 27, 2005.